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Modelling Walking: Exploring the Potential of Dynamic Microsimulation in Designing Streetscape

Pedestrians are receiving increasing attention as a key component of sustainable transport strategies. Transport policies often include objectives such as promoting walking and enhancing the pedestrian environment. Major new projects such as rail, bus and underground interchange design, streetscape enhancements and town centre development schemes all seek to improve the quality of the pedestrian environment.

Pedestrian computer simulation is still in its infancy for street environments; Models are being developed based on different theoretical assumptions. Outputs and applications vary. In this context, the paper explores the potential contribution of pedestrian dynamic micro simulation models generally used to model pedestrian flows in the built environment to the planning and design process of outdoor pedestrian facilities.

The paper proposes a classification of issues identified in congested outdoor pedestrian facilities, based on a literature review and data from recent case studies. The issues identified include:

- ✍ Improved pedestrian provision, such as widened footways;
- ✍ Impact of street furniture and other obstacles on pedestrian flow;
- ✍ Occurrence of “dead space”;
- ✍ Difficulties in navigation of crowded pedestrian spaces and transport interchanges;
- ✍ Conflicting interaction between pedestrians, cars and other vehicles.

Using a number of case studies, pedestrian dynamic software is used to model different streetscape design scenarios. This allows us to appreciate the ability of modelling to simulate different streetscape design schemes.

The conclusion is that pedestrian dynamic simulation modelling offers great potential for analysis at the micro scale, helping to develop a better understanding of the current level of service a pedestrian facility offers, as well as locating specific problems on the network. Time-series analysis also allows us to estimate how pedestrians might behave when using new facilities, identifying whether a proposed design will effectively resolve the problem being addressed.